



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,412	06/20/2006	Masashi Otsuki	Q95438	3565
23373 7590 08/04/2009 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER				
CHUO, TONY SHENG HSIANG				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
08/04/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/583,412

Applicant(s)

OTSUKI ET AL.

Examiner

Tony Chuo

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/86)
Paper No(s)/Mail Date 6/20/06 4/15/09
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 6/20/06 and 4/15/09 were filed on 6/20/06 and 4/15/09. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Ootsuki et al (JP 2003-249233).

The Ootsuki reference discloses a lithium primary cell (non-aqueous electrolyte cell) comprising: a positive electrode, a negative electrode, and an electrolyte solution comprising: gamma-butyrolactone (aprotic organic solvent/boiling point=204°C), LiBF₄

(support salt), and a phosphazene derivative A (formula (IV), $n=3$, two ethoxy and six fluoride among six R)(boiling point= 195°C), wherein the phosphazene derivative A has a boiling point which is not more than 25°C different from the boiling point of gamma-butyrolactone (See Abstract and paragraph [0135]). Examiner's note: paragraph [0103] of the present application discloses an additive H that is cyclic phosphazene compound of the formula (II), wherein n is 3, two of six R^4 's are ethoxy group and four are fluorine, wherein the boiling point is 195°C . Burden is on the applicant to show differences in product comparison.

Claim Rejections - 35 USC § 102/103

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-6 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Otsuki et al (WO/2003/005479) using (US 2004/0191635) as an equivalent English translation.

The Otsuki reference discloses a non-aqueous electrolyte cell comprising: a positive electrode, a negative electrode, and an electrolyte comprising: an aprotic organic solvent such as ethylene carbonate, propylene carbonate, diethyl carbonate (boiling point=127°C), dimethyl carbonate (boiling point=90°C), ethyl methyl carbonate (boiling point=108°C), 1,2-dimethoxy ethane, and γ -butyrolactone (boiling point=204°C); a support salt; and a phosphazene derivative represented by general formula (1) and general formula (2) (See Abstract and paragraphs [0116]-[0118],[0212]). It also discloses an Example 1 of the electrolyte comprising a mixed solvent of diethyl carbonate and ethylene carbonate (aprotic organic solvents), a support salt, and a phosphazene derivative (cyclic phosphazene derivative with ethoxy/fluorine ratio of 2/4) (See paragraph [0224]). It is inherent that a mixed solvent of diethyl carbonate and ethylene carbonate and a cyclic phosphazene derivative with ethoxy/fluorine ratio of 2/4 have a difference in boiling points that is not more than 25°C. Burden is on the applicant to show differences in product comparison.

8. Claims 7-11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Otsuki et al (WO/2003/005478) using (US 2004/0192853) as an equivalent English translation.

The Otsuki reference discloses a polymer cell comprising: a positive electrode, a negative electrode, and an electrolyte comprising: an aprotic organic solvent such as ethylene carbonate, propylene carbonate, diethyl carbonate (boiling point=127°C), dimethyl carbonate (boiling point=90°C), ethyl methyl carbonate (boiling point=108°C); a polymer; a support salt; and a phosphazene derivative represented by general formula

(1) and general formula (2) (See Abstract and paragraphs [0031]-[0039],[0061]-[0063],[0090]). It also discloses an Example 1 of the electrolyte comprising a mixed solvent of diethyl carbonate and ethylene carbonate (aprotic organic solvents), a support salt, and a phosphazene derivative (cyclic phosphazene derivative with ethoxy/fluorine ratio of 2/4) (See paragraph [0107]). It is inherent that a mixed solvent of diethyl carbonate and ethylene carbonate and a cyclic phosphazene derivative with ethoxy/fluorine ratio of 2/4 have a difference in boiling points that is not more than 25°C. Burden is on the applicant to show differences in product comparison.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ootsuki et al (JP 2003-249233). In addition, Ootsuki et al also discloses aprotic organic solvents such as ethylene carbonate, propylene carbonate, diethyl carbonate, dimethyl carbonate, and ethyl methyl carbonate (See paragraph [0028]). Further, Ootsuki et al also discloses a phosphazene derivative B (formula (IV), n=3, one methoxy and 5 fluoride among six R)(boiling point of 110°C) (See paragraph [0145]). Examiner's note: paragraph [0092] of the present application discloses an additive E that is cyclic phosphazene compound of the formula (II), wherein n is 3, one of six R⁴s is methoxy

group and five are fluorine, wherein the boiling point is 110°C. Burden is on the applicant to show differences in product comparison.

However, Ootsuki et al does not expressly teach a compound containing phosphorus and nitrogen in its molecule that has a difference of a boiling point from that of the respective aprotic organic solvent of not more than 25°C, wherein the aprotic organic solvent is at least one selected from the group consisting of ethylene carbonate, propylene carbonate, diethyl carbonate (boiling point=127°C), dimethyl carbonate (boiling point=90°C), and ethyl methyl carbonate (boiling point=108°C).

However, it would have been obvious to one of ordinary skill in the art to modify the Ootsuki electrolyte to include an aprotic organic solvent that has a boiling point of not more than 25°C from phosphazene derivative B, wherein the aprotic organic solvent is at least one selected from the group consisting of diethyl carbonate, dimethyl carbonate, and ethyl methyl carbonate because it would have been obvious to try the known aprotic organic solvents for forming a self-extinguishing, fire retardant, incombustible electrolyte solution with a reasonable expectation of success.

11. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuki et al (WO/2003/005479) using (US 2004/0191635) as an equivalent English translation.

The Otsuki reference discloses a non-aqueous electrolyte cell comprising: a positive electrode, a negative electrode, and an electrolyte comprising: an aprotic organic solvent such as ethylene carbonate, propylene carbonate, diethyl carbonate (boiling point=127°C), dimethyl carbonate (boiling point=90°C), ethyl methyl carbonate

(boiling point=108°C), 1,2-dimethoxy ethane (boiling point=85°C), and γ -butyrolactone (boiling point=204°C); a support salt, and a phosphazene derivative represented by general formula (1) and general formula (2) (See Abstract and paragraphs [0116]-[0118],[0212]). It also discloses an Example 1 of the electrolyte comprising a phosphazene derivative (cyclic phosphazene derivative with ethoxy/fluorine ratio of 2/4) (boiling point=195°C) and an Example 7 of the electrolyte comprising a phosphazene derivative (cyclic phosphazene derivative with ethoxy/fluorine ratio of 1/5) (boiling point=115°C) (See paragraph [0224],[0278] and Table 5).

However, Otsuki et al does not expressly teach a compound containing phosphous and nitrogen in its molecule that has a difference of a boiling point from that of the respective aprotic organic solvent of not more than 25°C, wherein the aprotic organic solvent is at least one selected from the group consisting of ethylene carbonate, propylene carbonate, diethyl carbonate, dimethyl carbonate, ethyl methyl carbonate, and γ -butyrolactone.

However, it would have been obvious to one of ordinary skill in the art to modify the Otsuki electrolyte to include an aprotic organic solvent that has a boiling point of not more than 25°C from phosphazene derivative, wherein the aprotic organic solvent is at least one selected from the group consisting of diethyl carbonate, dimethyl carbonate, ethyl methyl carbonate, and γ -butyrolactone because it would have been obvious to try the known aprotic organic solvents for forming a self-extinguishing, fire retardant, incombustible electrolyte solution with a reasonable expectation of success.

12. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuki et al (WO/2003/005478) using (US 2004/0192853) as an equivalent English translation.

The Otsuki reference discloses a polymer cell comprising: a positive electrode, a negative electrode, and an electrolyte comprising: an aprotic organic solvent such as ethylene carbonate, propylene carbonate, diethyl carbonate (boiling point=127°C), dimethyl carbonate (boiling point=90°C), ethyl methyl carbonate (boiling point=108°C), and 1,2-dimethoxy ethane (boiling point=85°C); a polymer; a support salt; and a phosphazene derivative represented by general formula (1) and general formula (2) (See Abstract and paragraphs [0031]-[0039],[0061]-[0063],[0090]). It also discloses an Example 2 of the electrolyte comprising a phosphazene derivative (cyclic phosphazene derivative with ethoxy/fluorine ratio of 1/5) (boiling point=115°C) (See paragraph [0224],[0278] and Table 5).

However, Otsuki et al does not expressly teach a compound containing phosphorus and nitrogen in its molecule that has a difference of a boiling point from that of the respective aprotic organic solvent of not more than 25°C, wherein the aprotic organic solvent is at least one selected from the group consisting of ethylene carbonate, propylene carbonate, diethyl carbonate, dimethyl carbonate, and ethyl methyl carbonate.

However, it would have been obvious to one of ordinary skill in the art to modify the Otsuki electrolyte to include an aprotic organic solvent that has a boiling point of not more than 25°C from phosphazene derivative, wherein the aprotic organic solvent is

at least one selected from the group consisting of diethyl carbonate, dimethyl carbonate, and ethyl methyl carbonate because it would have been obvious to try the known aprotic organic solvents for forming a self-extinguishing, fire retardant, incombustible electrolyte solution with a reasonable expectation of success.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

Application/Control Number: 10/583,412

Page 10

Art Unit: 1795

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795